REMARKS

Claims 1-7 are pending in the present application.

A. Rejection under 35 U.S.C. §102(e)

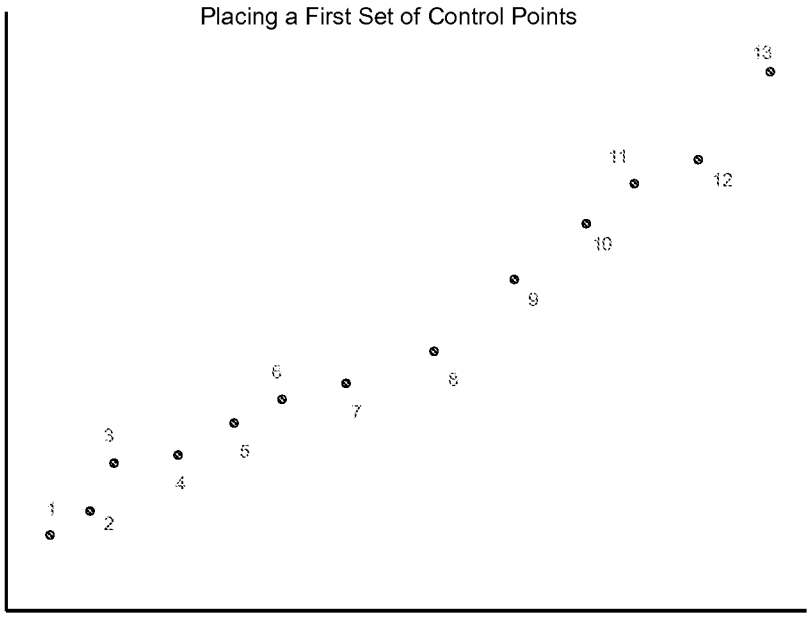
Claims 1-7 have been rejected under 35 U.S.C. §102(e) as being anticipated by Donaldson et al. (US Patent 6,694,109). This rejection under 35 U.S.C. §102(e) is respectfully traversed.

In formulating the rejection under 35 U.S.C. §102(e), the Examiner alleges that Donaldson et al. discloses placing a first set of control points on the tone reproduction curve (column 8, lines 7-9, of Donaldson et al.); fitting a first smoothed curve to the first set of control points (column 8, lines 12-16, of Donaldson et al.); moving a subset of points belonging to the set of first control points along the first smoothed curve (column 8, lines 17-19, of Donaldson et al.); generating a second set of control points comprising the moved first control points and the remaining unmoved first control points (column 8, lines 20-26, of Donaldson et al.); fitting a second smoothed curve to the second set of control points (column 8, lines 27-28, of Donaldson et al.); determining a differential function between the first and second fitted curves (column 8, lines 48-53, of Donaldson et al.); and adding the difference to the original curve to produce a smoothly modified last curve, which retains the original curve's characteristics (column 8, lines 63 to column 9, line 6 of Donaldson et al.). Based upon these allegations, the Examiner concludes that Donaldson et al. anticipates the presently claimed invention. These allegations and conclusion are respectfully traversed.

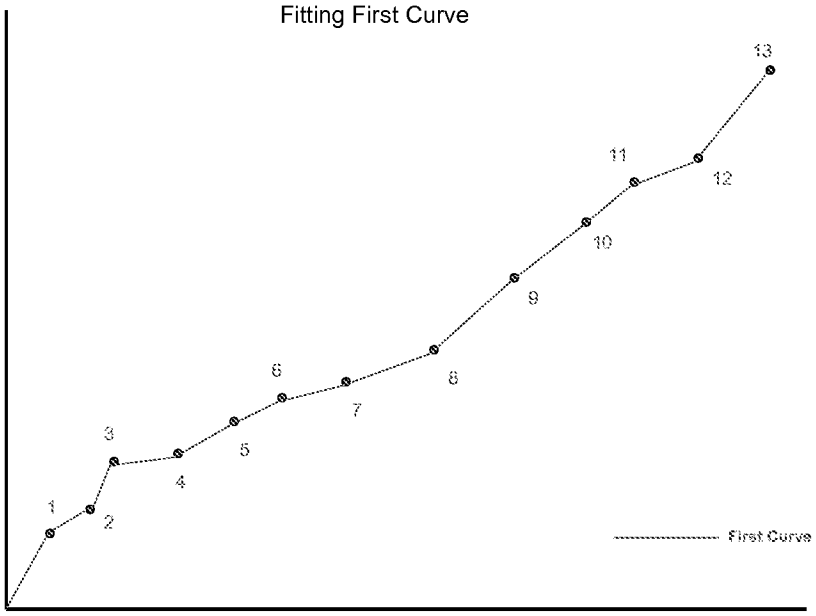
As set forth above, independent claim 1 recites a method for compensating for printer characteristics having a tone reproduction curve which is either too rough to be fitted by interpolation or which does not have a simple parametric function. The method places a first set of control points on the tone reproduction curve; fits a first smoothed curve to the first set of control points; moves a subset of points belonging to the set of first control points along the first smoothed curve; generates a second set of control points comprising the moved first control points and the remaining unmoved first control points; fits a second smoothed curve to the second set of control points; determines a differential function between the first and second fitted curves; and adds the difference

to the original curve to produce a smoothly modified last curve, which retains the original curve's characteristics.

Initially, it is apparent from the Examiner's that the Examiner has failed to properly construe the presently claimed invention. As set forth above, the claimed invention places a first set of control points on the tone reproduction curve. An illustrated example of the first set of control points on the tone reproduction curve is shown below in red.

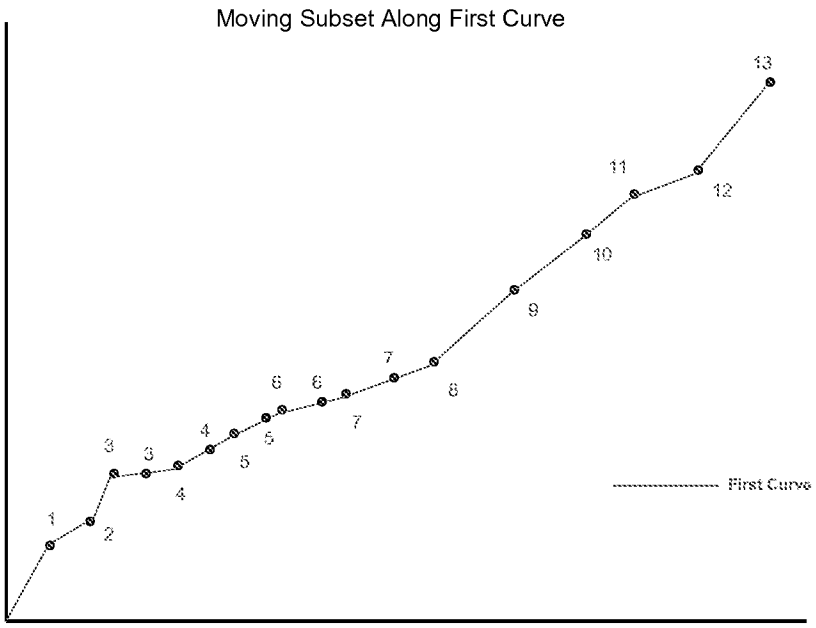


The claimed invention then fits a first smoothed curve to the first set of control points. An illustrated example of the fitting of a first curve (in red) to the first set of control points is shown below, but the curve is not smooth because the curve was generated in a graphic application, not a mathematical application.

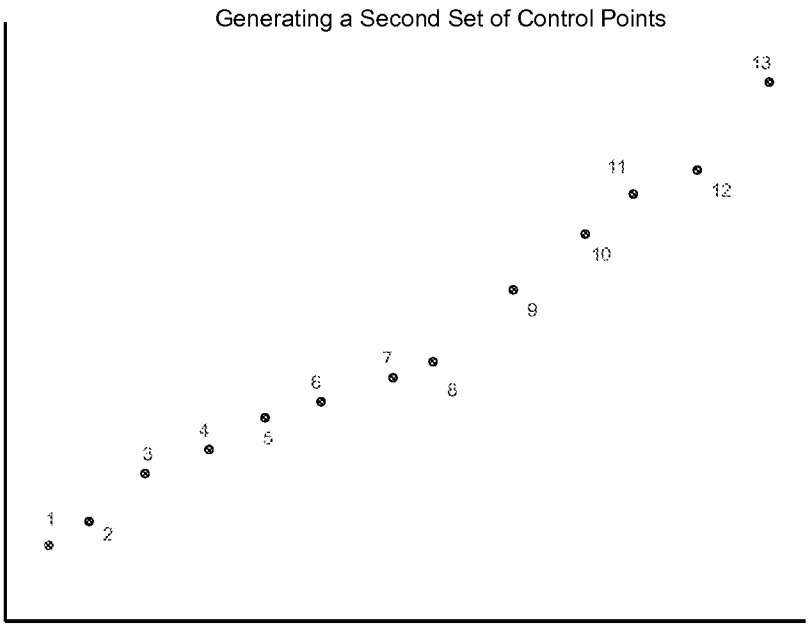


The claimed invention then moves a subset of points belonging to the set of first control points along the first smoothed curve. An illustrated example of the subset of points (3, 4, 5, 6, and 7) belonging to the set of first control points which have been moved along the first smoothed curve is shown below in blue.

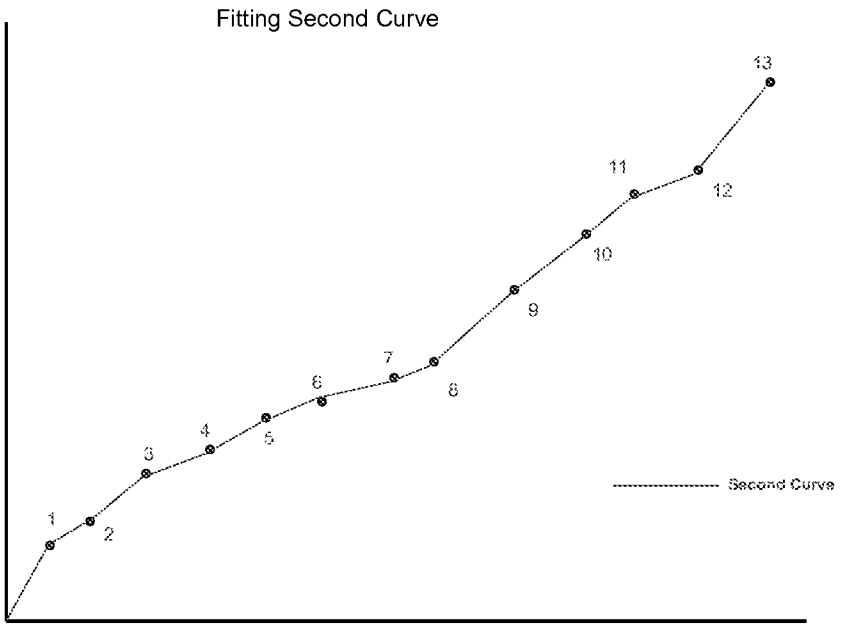
In this illustrated example, point 3 (in red) of the first set of control points is moved along the first fitted curve to new position point 3 (in blue). Moreover, in this illustrated example, point 4 (in red) of the first set of control points is moved along the first fitted curve to new position point 4 (in blue). Also, in this illustrated example, point 5 (in red) of the first set of control points is moved along the first fitted curve to new position point 5 (in blue). Furthermore, in this illustrated example, point 6 (in red) of the first set of control points is moved along the first fitted curve to new position point 6 (in blue). Lastly, in this illustrated example, point 7 (in red) of the first set of control points is moved along the first fitted curve to new position point 7 (in blue).



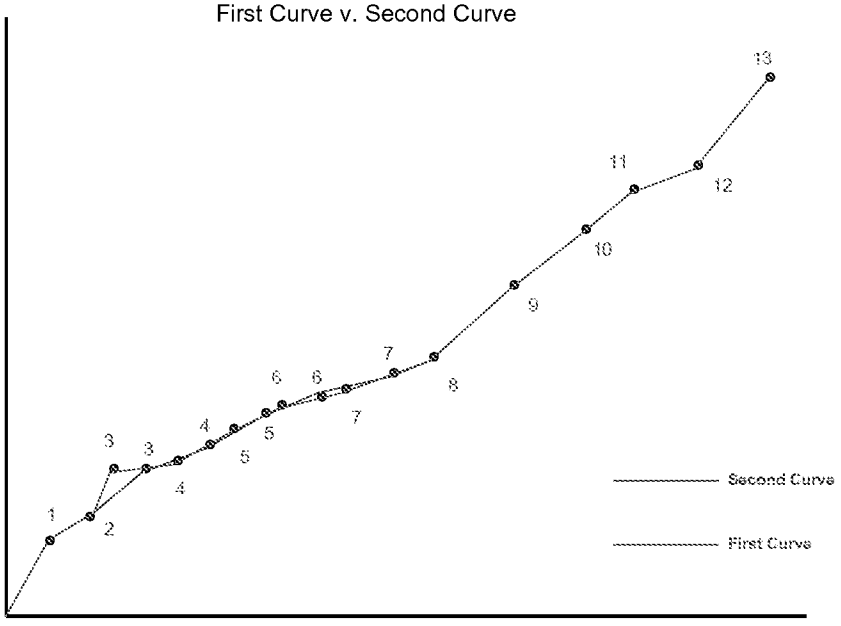
The claimed invention then generates a second set of control points comprising the moved first control points and the remaining unmoved first control points. An illustrated example of the moved subset of points (3, 4, 5, 6, and 7 illustrated in blue above) belonging to the set of first control points and the remaining unmoved first control points (1, 2, and 8-13 illustrated in red above) is shown below in blue.



The claimed invention then fits a second smoothed curve to the second set of control points. An illustrated example of the fitting of a second curve (in blue) to the second set of control points (illustrated above) is shown below, but the curve is not smooth because the curve was generated in a graphic application, not a mathematical application.



The illustration below shows the difference between the second curve (in blue) and the first curve (in red). An illustrated example of the claimed determination of a differential function between the first and second fitted curves is shown below.



As is clearly illustrated above, the teachings of Donaldson et al. fail to anticipate the claimed invention.

Notwithstanding, the Examiner asserts that Donaldson et al. sets forth, in column 8, lines 7-26, placing a first set of control points on the tone reproduction curve; fitting a first smoothed curve to the first set of control points; moving a subset of points belonging to the set of first control points along the first smoothed curve; and generating a second set of control points comprising the moved first control points and the remaining unmoved first control points. This assertion by the Examiner is inconsistent with the actual disclosure of Donaldson et al., at column 8, lines 7-26.

More specifically, Donaldson et al., at column 8, lines 7-26, sets forth:

> . . . measuring a tone reproduction curve at a plurality of points, wherein the tone reproduction curve has end points comprising a first point and a last point; computing differences of the measured tone reproduction curve from a target tone reproduction curve; calculating model deltas by fitting the differences to a mathematical function wherein the end points remain fixed and the model deltas are computed using the mathematical function; calculating a model tone reproduction curve by adding the model deltas to values from the target tone reproduction curve; generating a new tone reproduction curve LUT by comparing the model tone reproduction curve to the target tone reproduction curve wherein the change in magnitude between each entry of the new tone reproduction curve LUT and a current tone reproduction curve LUT is limited to a predetermined maximum change value. . .

The Examiner alleges that calculating a model tone reproduction curve by adding the model deltas to values from the target tone reproduction curve, as taught by Donaldson et al., anticipates moving a subset of points belonging to the set of first control points along the first smoothed curve, as set forth by independent claim 1. The presently claimed invention recites that a subset of points belonging to the set of first control points are moved along the first smoothed curve.

Based upon the Examiner's assertions in formulating the rejection, the Examiner must hold forth that the calculated model deltas are the claimed first smoothed curve. If the calculated model deltas are the claimed first smoothed curve, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al.

teaches that a subset of points belonging to the set of first control points are moved along the model deltas.

In the alternative, if the calculated model deltas are **not** the claimed first smoothed curve, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches the claimed first smoothed curve and that a subset of points belonging to the set of first control points are moved along the first smoothed curve.

Notwithstanding, Donaldson et al. fails to teach that a subset of points belonging to the set of first control points are moved along the first smoothed curve, as set forth by independent claim 1.

Moreover, Donaldson et al., at column 5, lines 19-26, sets forth:

> FIG. 3 illustrates actual TRC variation from the target TRC, due to error caused by dead band control at the midpoint and a method for reducing deltaE error caused by dead band control. Actual TRC 36 varies from target TRC 38 by an amount characterized as deltaE and shown as numeral 40 in FIG. 3. This error can be compensated for by printing a halftone density that is adjusted from the desired halftone density by a correction amount 42 such that the developed halftone density matches the requested halftone density. For example, an image might require a halftone density of 128 bits and, as shown in FIG. 3, reducing the requested 128 bits by correction factor 42 of 6 bits and printing a 122 bit density, results in a developed halftone equal to the original requested 128 bit halftone. Implementing the concepts disclosed herein results in halftone color print errors of about 3 $\text{deltaE}_{\text{CMC 1.3:1}}$ or less.

In other words, Donaldson et al. teaches (at column 5, lines 19-26, and in Figure 3) that two separate tonal-reproduction curves are created, a target tonal-reproduction curve and an actual tonal-reproduction curve. Upon the creation of the two separate tonal-reproduction curves, Donaldson et al. teaches that delta values are calculated, as illustrated in Figure 3 of Donaldson et al. These delta values are then utilized to create a third tonal-reproduction curve (model tonal-reproduction curve) by adding the model deltas to values from the target tone reproduction curve, as set forth at column 8, lines 7-26, of Donaldson et al.

Donaldson et al. further teaches, at column 8, lines 7-26, generating a fourth tone reproduction curve (new tone reproduction curve LUT) by comparing the model tone reproduction curve to the target tone reproduction curve wherein the change in magnitude between each entry of the new tone reproduction curve LUT and a current tone reproduction curve LUT is limited to a predetermined maximum change value.

In contrast, the presently claimed invention clearly sets forth placing a first set of control points on a tone reproduction curve. The claimed invention fits a first smoothed curve to the first set of control points, thus creating a first smooth curve. The Examiner is respectfully requested to identify the **specific** language or illustrated reference in Donaldson et al. which anticipates the claimed first smooth curve.

The claimed invention **moves** a subset of points belonging to the set of first control points **along** the first smoothed curve. Generating two tone reproduction curves and calculating the deltas therefrom fails to anticipate **moving** a subset of points belonging to the set of first control points **along** the first smoothed curve. Again, the Examiner is respectfully requested to identify the **specific** language or illustrated reference in Donaldson et al. which anticipates the claimed moving of a subset of points belonging to the set of first control points **along** the first smoothed curve.

In response to the Applicant's previous arguments, the Examiner asserts that the "addition of the model deltas is effective enough to change or move the subset of points within the model tone reproduction curve." The Examiner then concludes that although "the Donaldson et al. reference disclose [sic] this specific limitation as delta values, the Examiner would like to point out that the overall scope of the limitation has been disclosed."

Initially, as clearly presented above, the claimed invention specifically recites **moving** a subset of points belonging to the set of first control points **along** the first smoothed curve. The claimed invention does not recite moving a subset of points belonging to the set of first control points **within** the first smoothed curve. Thus, the Examiner allegations are misplaced.

Also, the claimed invention generates a **second** set of control points comprising the **moved first control points** and the **remaining unmoved first control points**. Generating a fourth tone reproduction curve (new tone reproduction curve LUT) by

comparing the model tone reproduction curve to the target tone reproduction curve wherein the change in magnitude between each entry of the new tone reproduction curve LUT and a current tone reproduction curve LUT is limited to a predetermined maximum change value fails to anticipate generating a **second** set of control points comprising **the moved first control points** and **the remaining unmoved first control points**.

Notwithstanding the above arguments, the Examiner alleges that generating a new tone reproduction curve LUT by comparing the model tone reproduction curve to the target tone reproduction curve wherein the change in magnitude between each entry of the new tone reproduction curve LUT and a current tone reproduction curve LUT is limited to a predetermined maximum change value, as taught by Donaldson et al., anticipates generating a second set of control points comprising the moved first control points and the remaining unmoved first control points, as set forth by independent claim 1.

Based upon the Examiner's assertions in formulating the rejection, the Examiner must hold forth that the new tone reproduction curve LUT is the claimed second set of control points comprising the moved first control points and the remaining unmoved first control points.

If the values in the new tone reproduction curve LUT are the claimed second set of control points comprising the moved first control points and the remaining unmoved first control points, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches that the values in the new tone reproduction curve look-up table comprise the moved first control points (a subset of points belonging to the set of first control points which have been moved along the first smoothed curve) and the remaining unmoved first control points (a subset of points belonging to the set of first control points which have **not** been moved along the first smoothed curve).

More specifically, the Examiner is respectfully requested to identify the **specific** language or illustrated reference in Donaldson et al. which anticipates the claimed **second** set of control points that includes both the **moved first control points** and the **remaining unmoved first control points**.

In the alternative, if the values in the new tone reproduction curve LUT are **not** the claimed second set of control points comprising the moved first control points and the remaining unmoved first control points, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches generating a second set of control points comprising the moved first control points and the remaining unmoved first control points.

Lastly, the claimed invention fits a second smoothed curve to the second set of control points. Modifying the fourth tone reproduction curve (new tone reproduction curve LUT) fails to anticipate fitting a second smoothed curve to the second set of control points.

The Examiner asserts that Donaldson et al. sets forth fitting a second smoothed curve to the second set of control points (column 8, lines 27-28, of Donaldson et al.); determining a differential function between the first and second fitted curves (column 8, lines 48-53, of Donaldson et al.); and adding the difference to the original curve to produce a smoothly modified last curve, which retains the original curve's characteristics (column 8, lines 63 to column 9, line 6 of Donaldson et al.). This assertion by the Examiner is inconsistent with the actual disclosure of Donaldson et al., at column 8, lines 27-28; column 8, lines 48-53; and column 8, lines 63 to column 9, line 6.

More specifically, Donaldson et al., at column 8, lines 27-28, sets forth, "replacing the current tone reproduction curve LUT with the new tone reproduction curve LUT." Moreover, Donaldson et al., at column 8, lines 48-53, sets forth, "computing differences of the measured tone reproduction curve from a target tone reproduction curve; calculating model deltas by fitting the differences to a mathematical function wherein the end points remain fixed and the model deltas are computed using the mathematical function."

Donaldson et al., at column 8, lines 63 to column 9, line 6, sets forth:

> . . . modifying the new tone reproduction curve LUT by performing, for each entry in the new tone reproduction curve LUT, the conditional steps of: setting new tone reproduction curve LUT entry equal the current tone reproduction curve LUT entry plus the value of a predetermined

> maximum change value and setting an update interval variable to a predetermined fast value if the new tone reproduction curve LUT entry exceeds the current tone reproduction curve LUT entry by more than the predetermined maximum change value. . .

The Examiner alleges that replacing the current tone reproduction curve LUT with the new tone reproduction curve LUT, as taught by Donaldson et al., anticipates fitting a second smoothed curve to the second set of control points, as set forth by independent claim 1.

As discussed above, the Examiner's assertions in formulating the rejection hold forth that the values in the new tone reproduction curve LUT are the claimed second set of control points.

If the values in the new tone reproduction curve LUT are the claimed second set of control points, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches that the values in the new tone reproduction curve look-up table are fitted to a second smooth curve. More specifically, the Examiner is respectfully requested to identify the **specific** language or illustrated reference in Donaldson et al. which anticipates the claimed fitting of a second smoothed curve to the second set of control points.

In the alternative, if the values in the new tone reproduction curve LUT are **not** the claimed second set of control points comprising the moved first control points and the remaining unmoved first control points, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches fitting a second smoothed curve to the second set of control points.

Notwithstanding, Donaldson et al. fails to teach fitting a second smoothed curve to the second set of control points, as set forth by independent claim 1.

Also, the Examiner alleges that computing differences of the measured tone reproduction curve from a target tone reproduction curve and calculating model deltas by fitting the differences to a mathematical function wherein the end points remain fixed and the model deltas are computed using the mathematical function, as taught by Donaldson et al., anticipates determining a differential function between the first and second fitted curves wherein the second fitted curve is generated by fitting a curve to a

second set of control points, the second set of control points comprising the moved first control points and the remaining unmoved first control points, as set forth by independent claim 1.

As discussed above, the Examiner's assertions in formulating the rejection hold forth that the values in the new tone reproduction curve LUT are the claimed second set of control points. If the values in the new tone reproduction curve LUT are the claimed second set of control points, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches a differential function is determined between a first fitted curve and the fitted curve allegedly generated by the values in the new tone reproduction curve look-up table.

In the alternative, if the values in the new tone reproduction curve LUT are **not** the claimed second set of control points comprising the moved first control points and the remaining unmoved first control points, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches determining a differential function between the first and second fitted curves wherein the second fitted curve is generated by fitting a curve to a second set of control points, the second set of control points comprising the moved first control points and the remaining unmoved first control points.

Notwithstanding, Donaldson et al. fails to teach determining a differential function between the first and second fitted curves, as set forth by independent claim 1.

Further, the Examiner alleges that modifying the new tone reproduction curve LUT by performing, for each entry in the new tone reproduction curve LUT, the conditional steps of: setting new tone reproduction curve LUT entry equal the current tone reproduction curve LUT entry plus the value of a predetermined maximum change value and setting an update interval variable to a predetermined fast value if the new tone reproduction curve LUT entry exceeds the current tone reproduction curve LUT entry by more than the predetermined maximum change value, as taught by Donaldson et al., anticipates adding the difference to the original curve to produce a smoothly modified last curve, which retains the original curve's characteristics, as set forth by independent claim 1.

As discussed above, the Examiner's assertions in formulating the rejection hold forth that the new tone reproduction curve LUT is the claimed original curve. If the new tone reproduction curve LUT is the claimed original curve, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches the creation of two fitted curves prior to the generation of the new tone reproduction curve LUT and the determination of a differential function between the two fitted curves so that the differences can be added to the new tone reproduction curve look-up table to produce a smoothly modified last curve, which retains the new tone reproduction curve LUT curve's characteristics.

In the alternative, if the new tone reproduction curve LUT is **not** the claimed original curve, the Applicant respectfully requests that the Examiner specifically point out where Donaldson et al. teaches adding the difference to the original curve to produce a smoothly modified last curve, which retains the original curve's characteristics.

Notwithstanding, Donaldson et al. fails to teach adding the difference to the original curve to produce a smoothly modified last curve, which retains the original curve's characteristics

Therefore, contrary to the Examiner's assertion, Donaldson et al. fails to anticipate, as set forth by independent claim 1:

> **(a) moving a subset of points belonging to the set of first control points along the first smoothed curve;**
>
> **(b) generating a second set of control points comprising the moved first control points and the remaining unmoved first control points;**
>
> **(c) fitting a second smoothed curve to the second set of control points;**
>
> **(d) determining a differential function between the first and second fitted curves; and/or**
>
> **(e) adding the difference to the original curve to produce a smoothly modified last curve, which retains the original curve's characteristics.**

With respect to dependent claims 2-7, the Applicant, for the sake of brevity, will not address the reasons supporting patentability for these individual dependent claims, as these claims depend directly or indirectly from allowable independent claim 1. The Applicant reserves the right to address the patentability of these dependent claims at a later time, should it be necessary.

Accordingly, in view of the remarks set forth above, the Examiner is respectfully requested to reconsider and withdraw the rejection under 35 U.S.C. §102(e).

CONCLUSION

Accordingly, in view of all the reasons set forth above, the Examiner is respectfully requested to reconsider and withdraw the present rejection. Also, an early indication of allowability is earnestly solicited.

Respectfully submitted,

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